

Class 1 Permit Modification Notification

Central Monitoring System Upgrade

**Waste Isolation Pilot Plant
Carlsbad, New Mexico**

WIPP HWFP #NM4890139088-TSDF

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Acronyms and Abbreviations

CFR	Code of Federal Regulations
CMS	Central Monitoring System
HWFP	Hazardous Waste Facility Permit
NMAC	New Mexico Administrative Code
PMN	Permit Modification Notification
TSDf	Treatment, Storage and Disposal Facility
WIPP	Waste Isolation Pilot Plant

Overview of the Permit Modification Notification

This document contains one Class 1 Permit Modification Notification (**PMN**) to the Hazardous Waste Facility Permit (**HWFP**) at the Waste Isolation Pilot Plant (**WIPP**), Permit Number NM4890139088-TSDF, hereinafter referred to as the WIPP HWFP.

This PMN is being submitted by the U.S. Department of Energy, Carlsbad Field Office and Washington TRU Solutions LLC, collectively referred to as the Permittees, in accordance with the WIPP HWFP, Condition I.B.1 (20.4.1.900 New Mexico Administrative Code (**NMAC**) incorporating 40 Code of Federal Regulations (**CFR**) §270.42(a)). The PMN in this document is necessary to facilitate the installation of an upgraded Central Monitoring System (**CMS**). This change does not reduce the ability of the Permittees to provide continued protection to human health and the environment.

The requested modification to the WIPP HWFP and related supporting documents are provided in this PMN. The proposed modification to the text of the WIPP HWFP has been identified using a double underline and revision bar in the right hand margin for added information, and a ~~strikeout~~ font for deleted information. All direct quotations are indicated by italicized text.

Attachment A

Description of the Class 1 Permit Modification Notification

Table 1. Class 1 Hazardous Waste Facility Permit Modification Notification

No.	Affected Permit Section	Item	Category	Attachment A Page #
1	a.1. Attachment E-2d	Replace the current CMS with an upgraded network system. Modify the network description in Attachment E.	A.3	A-3

Item 1

Description:

This modification will update the description of the CMS in the HWFP, Section E-2d, to reflect modern terminology used to describe computer systems by replacing the term "data highway" with "network." It will also update the description of the network cabling, replacing the obsolete coaxial cables, to reflect the advanced technology cabling being installed to upgrade the CMS.

Basis:

Many of the components of the existing CMS are no longer made or available because technological advances have made them obsolete. The lack of availability of critical spare parts and the age of the current CMS require that the system be upgraded. The design basis for the upgraded CMS provides the same specific functions and capabilities of the CMS as described in the HWFP Attachments D and E. This change requires a Class 1 PMN pursuant to 40 CFR 270.42, Appendix I, Item A.3 (Equipment replacement or upgrading with functionally equivalent components).

Federal Register Volume 53, Number 188, Page 37925 (September 28, 1988) provided a discussion of Appendix I, Item A.3. This reference indicated that *"this will allow the facility to change ancillary equipment without prior approval if the original equipment is no longer made or to take advantage of better designed products, so long as the new equipment is functionally equivalent to the equipment it replaced."* Section 20.4.1.900 NMAC (incorporating 40 CFR 270.2) defines *"functionally equivalent component"* as *"a component which performs the same function or measurement and which meets or exceeds the performance specifications of another component."*

The planned upgrade to the CMS has been designed to perform and to meet the functions, controls, inspections, and power requirements specified in the HWFP as demonstrated in Attachment B, Table 1 of this modification package. The only change to the description of the CMS in the HWFP is to the description of the data highway (redundant coaxial cables) routed throughout the facility. The function of the data highway (redundant coaxial cables) is to transfer data and information from one computer/controller to another. This function will be performed by standard computer network cables for the upgraded CMS. The standard network cables include fiber optic cables and category five unshielded twisted pair (copper wire) cables (similar to any Local Area Network [LAN]).

Therefore, this planned component upgrade meets the definition of *"functionally equivalent component"* in 20.4.1.900 NMAC (incorporating 40 CFR 270.2). As a result, this change meets the requirements for a Class 1 PMN in accordance with 40 CFR 270.42, Appendix I, Item A.3 (Equipment replacement or upgrading with functionally equivalent components).

Discussion:

Many of the components of the existing CMS are no longer made or available because technological advances have made them obsolete. The lack of availability of these critical spare parts and the age of the current CMS require that the system be upgraded.

The upgraded CMS is designed to perform all of the functions of the current system as described in the HWFP. This change does not impact the descriptions of the functions or capabilities of the CMS described in the HWFP. The only HWFP change necessary is the description of the communication cables. This change utilizes modern technology network cables to perform the equivalent function of outdated coaxial cables.

Revised Permit Text:

a. 1. E-2d Equipment and Power Failure *(last two paragraphs, pages E-11, 12)*

The major components of the system are interconnected by means of a dual, redundant ~~data highway~~ network. The ~~data highway~~ network is the communications medium for the CMS and consists of ~~dual coaxial~~ network cables routed throughout the facility. The ~~system can function on only one of the data highways~~ network is designed such that no single point failure will cause failure of the entire network. Parameters or status are monitored by Local Processing Units strategically located throughout the surface and underground facility.

In addition, a number of automatic checks are performed on the internal processes associated with system components and ~~data highway~~ network communications. If any fault is detected, the system has the capability to remove a component from the ~~data highway~~ network and alert the CMR Operator (CMRO) of the fault. The status of the ~~data highways~~ network is continuously monitored by the CMRO 24 hours per day, seven days per week. If a fault occurs, the CMRO initiates an AR within the Work Control system to correct the problem.

Attachment B

**Table 1. Upgrade of Central Monitoring System
Description/Function Comparison**

Upgraded CMS	Current CMS
<p><u>Description:</u> Distributed network interfacing computers, local processing units, and controllers using off the shelf technology.</p> <p>NOTE: Off the shelf technology improves reliability, ease of replacement/upgrade of component hardware, and reduces operating/maintenance costs.</p>	<p><u>Description:</u> Distributed network interfacing computers, local processing units, and controllers using specially designed hardware and software interfaces.</p> <p>NOTE: At the time the original system was designed, off the shelf distributed computer networks did not exist. Networks were operated on a master/slave principal and if the master failed, the network failed.</p>
<p><u>Function: (no change)</u> HWFP Attachment D-1a(3) & Table D-2 - <i>continuously assess the status of the fixed radiation monitoring equipment, electrical power, fire alarm systems, ventilation system, and other facility systems including water tank levels. In addition, the CMS collects data from the meteorological monitoring system.</i></p>	<p><u>Function:</u> HWFP Attachment D-1a(3) & Table D-2 - <i>continuously assess the status of the fixed radiation monitoring equipment, electrical power, fire alarm systems, ventilation system, and other facility systems including water tank levels. In addition, the CMS collects data from the meteorological monitoring system.</i></p>
<p><u>Function: (no change)</u> HWFP Attachment E-2d - <i>The system is designed to provide a centralized, integrated location for collecting, monitoring, and storing facility parameters and is informed from signals provided by the seismic, meteorological, radiological effluent, and fire detection and alarm systems. Additionally, the CMS monitors heating, ventilation, air conditioning and electrical system status.</i></p>	<p><u>Function:</u> HWFP Attachment E-2d - <i>The system is designed to provide a centralized, integrated location for collecting, monitoring, and storing facility parameters and is informed from signals provided by the seismic, meteorological, radiological effluent, and fire detection and alarm systems. Additionally, the CMS monitors heating, ventilation, air conditioning and electrical system status.</i></p>
<p><u>Control: (no change)</u> HWFP Attachment E-2d - <i>Certain control functions of the underground ventilation fans, major facility electrical systems, and the backup diesel generators can be performed by the CMS from the CMR.</i></p>	<p><u>Control:</u> HWFP Attachment E-2d - <i>Certain control functions of the underground ventilation fans, major facility electrical systems, and the backup diesel generators can be performed by the CMS from the CMR.</i></p>
<p><u>Maximum number of sensors:</u> 16,000,000</p>	<p><u>Maximum number of sensor:</u> 16,000</p>

Upgraded CMS	Current CMS
<p><u>Power: (no change)</u> HWFP Attachment E-2d - <i>The CMS components of the WHB Unit and the Support Building are powered from the central UPS. The UPS features automatic switching without a loss of power from primary power to alternate power to battery backup power. The components located throughout the facility are powered by various electrical switchboards, with UPS battery backup.</i></p> <p>NOTE: The new system is significantly more energy efficient requiring less power to operate, extending the amount of time that the system can operate with UPS battery backup.</p>	<p><u>Power:</u> HWFP Attachment E-2d - <i>The CMS components of the WHB Unit and the Support Building are powered from the central UPS. The UPS features automatic switching without a loss of power from primary power to alternate power to battery backup power. The components located throughout the facility are powered by various electrical switchboards, with UPS battery backup.</i></p>
<p><u>Inspection: (no change)</u> HWFP Attachment E-2d - <i>status of the <u>network</u> is continuously monitored by the CMRO 24 hours per day, seven days per week. If a fault occurs, the CMRO initiates an AR within the Work Control system to correct the problem.</i></p> <p>NOTE: As indicated in HWFP Table D-1, this inspection/monitoring is performed by the CMS automatically.</p>	<p><u>Inspection:</u> HWFP Attachment E-2d - <i>status of the <u>data highways</u> is continuously monitored by the CMRO 24 hours per day, seven days per week. If a fault occurs, the CMRO initiates an AR within the Work Control system to correct the problem.</i></p> <p>NOTE: As indicated in HWFP Table D-1, this inspection/monitoring is performed by the CMS automatically.</p>
<p><u>Network Cables: (Change necessary)</u> HWFP Attachment E-2d -</p> <ul style="list-style-type: none"> - Network cables configured in a loop arrangement for redundancy. Network consists of a fiber optic backbone and Cat 5 UTP cables connecting processing units to switches. - No single point failure in the backbone shall disrupt the operation of the CMS. - Provides data transfer rates an order of magnitude greater than coaxial cables. - Electrical noise does not interfere with signal. 	<p><u>Network Cables:</u> HWFP Attachment E-2d -</p> <ul style="list-style-type: none"> - Dual (redundant) coaxial cables routed throughout the facility. - Can function on only one cable. - Subject to electrical noise.